

WHAT IS CLAIMED IS:

1. A wideband optical fiber amplifier for amplifying and outputting wideband optical signals, the wideband optical signal including C-band optical signals and L-band
5 optical signals, comprising;

a first amplification section for amplifying and outputting the wideband optical signals including the C-band optical signals and the L-band optical signals and for outputting amplified spontaneous emissions generated in a process of amplifying the wideband optical signals;

10 a C/L splitter for separating the wideband optical signals amplified by the first amplification section into the C-band optical signals and the L-band optical signals and then outputting separated C-band optical signals and separated L-band optical signals;

a second amplification section for amplifying and outputting the separated L-band optical signals;

15 an optical signal coupler for combining the separated C-band optical signals output from the C/L splitter with the separated L-band optical signals amplified by the second amplification section and then outputting the combined optical signals; and

an optical circulator having a first port for receiving the wideband optical signals, a second port for causing the wideband optical signals to be output and for causing
20 spontaneous emission generated from the first amplification section to be input, a third port for causing the spontaneous emissions to be provided as pumping lights for the second amplification section and for causing the separated L-band optical signals amplified by the

second amplification section to be input and a fourth port for causing the L-band optical signals input into the third port to be output to the optical signal coupler.

2. A wideband optical fiber amplifier according to claim 1, further comprising an
5 optical isolator for blocking optical signals advancing opposite to a direction in which the wideband optical signals advance between the first amplification section and the C/L splitter.

3. A wideband optical fiber amplifier according to claim 1, wherein the first
10 amplification section includes:

at least one pumping diode for generating pumping lights so as to amplify the wideband optical signals input into the first amplification section;

a first rare-earth element doped optical fiber, pumped by the pumping lights, for amplifying the wideband optical signals which are input into the first rare-earth element
15 doped optical fiber; and

a wavelength selection coupler for inputting the pumping lights generated from the at least one pumping diode into the first rare-earth element doped optical fiber on an input side of the first rare-earth element doped optical fiber.

20 4. A wideband optical fiber amplifier according to claim 1, wherein the second amplification section includes:

at least one pumping diode for generating pumping lights so as to amplify the

separated L-band optical signals input into the second amplification section;

a second rare-earth element doped optical fiber, pumped by the pumping lights, for amplifying the separated L-band optical signals which input into the second rare-earth element doped optical fiber; and

5 a wavelength selection coupler for inputting the pumping lights generated from the at least one pumping diode into the second rare-earth element doped optical fiber on an input side of the second rare-earth element doped optical fiber.

5. A wideband optical fiber amplifier according to claim 1, wherein the wideband
10 optical signals are provided by an optical communication network.

6. A wideband optical fiber amplifier according to claim 1, wherein the combined optical signals are provided to an optical communication network.